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Le but de cette recherche était d'évaluer le rendement scolaire et les caractéristiques des élèves de milieux défavorisés (élèves SED) qui fréquentent des écoles ayant une population hétérogène du point de vue socio-économique. L'étude a été menée en 1re année et en 4e année. Des tests de rendement en anglais et en mathématiques et un inventaire de motivation et d'image de soi ont été administrés à tous les élèves. Un test de français a été inclus pour les élèves de 4e année. Les résultats de cette étude nous mènent à conclure que le rendement scolaire des élèves SED qui fréquentent les écoles de milieux socio-économiques hétérogènes n'est généralement pas supérieur à celui des élèves SED qui fréquentent des écoles de milieux défavorisés. En ce qui concerne les caractéristiques affectives, les élèves SED dans les écoles de milieux hétérogènes ne semblent pas différer de leurs pairs NON-SED.

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Assessment of the Academic Achievement and Affective Characteristics of Pupils from Socio-Economically Disadvantaged Backgrounds in Non-Inner City Schools

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Grades 1 and 4

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Résumé

Le but de cette recherche était d'évaluer le rendement scolaire et les caractéristiques affectives des élèves provenant de milieux défavorisés (élèves SED) qui fréquentent des écoles ayant une population hétérogène du point de vue socio-économique. L'étude a été menée en 1ère année et en 4ème année. A chaque niveau, on a comparé les élèves SED des écoles de milieu socio-économique hétérogène (groupe SED_3) à des élèves SED qui fréquentent des écoles de milieu défavorisé du type Inner City (groupe SED_2) et du type core Inner City (groupe SED_1). Trois groupes d'élèves provenant de milieux plus favorisés et qui étudiaient dans les mêmes classes que les élèves SED ont été inclus dans l'étude (groupes NON-SED).

Des tests de rendement en anglais et en mathématiques et un inventaire de motivation et d'image de soi ont été administrés à tous les élèves. Un test de français a été inclus pour les élèves de 4ème année.

Les résultats de la 1ère année indiquent que: (1) Il n'y a aucune différence significative entre les groupes SED_1, SED_2 et SED_3 à l'ensemble des tests. (2) Chacun des groupes SED a obtenu des résultats nettement inférieurs à ceux du groupe NON-SED correspondant à trois tests d'anglais. De plus, à un des tests de mathématiques, le groupe SED_1 a obtenu des résultats nettement inférieurs à ceux du groupe NON-SED correspondant. (3) Il n'y a aucune différence significative entre le groupe SED_3 et le groupe NON-SED correspondant à l'inventaire de motivation et d'image de soi.

Les résultats de la 4ème année indiquent que: (1) Il n'y a pas de différence significative entre les groupes SED_1, SED_2 et SED_3 aux tests d'anglais et de mathématiques. (2) Le groupe SED_1 a obtenu des résultats

nettement inférieurs à ceux des groupes SED_2 et ECD_3 au test de français. [3] Les groupes SED_2 et SED_3 ont obtenu des résultats inférieurs à ceux du groupe SED_1 à l'inventaire de motivation et d'image de soi. [4] Le groupe SED_3 a obtenu des résultats nettement inférieurs à ceux du groupe NON-SED correspondant à tous les tests d'anglais et de mathématiques sauf aux tests de vocabulaire et de concepts en mathématiques. Entre les autres groupes SED et les groupes NON-SED correspondants, on a trouvé moins de différences significatives.

Les résultats de cette étude nous mènent à conclure que le rendement scolaire des élèves SED qui fréquentent les écoles de milieu socio-économique hétérogène n'est généralement pas supérieur à celui des élèves SED qui fréquentent des écoles de milieu défavorisé. De plus, les différences entre les élèves SED et les élèves NON-SED des écoles de milieu hétérogène sont plus prononcées en $4^{ème}$ année qu'en $1^{ère}$ année. En ce qui concerne les caractéristiques affectives, les élèves SED dans les écoles de milieu hétérogène ne semblent pas différer de leurs pairs NON-SED. Toutefois, en $4^{ème}$ année, des écarts se dégagent entre les élèves SED des trois types d'écoles.

Summary

The purpose of this study was to assess the academic achievement and affective characteristics of pupils from socio-economically disadvantaged backgrounds (SED pupils) who attend non-Inner City schools. Two grade levels were investigated: grade 1 and grade 4. At each grade level, the pupils in the non-Inner City schools (SED_3 group) were compared to SED pupils in Inner City schools (SED_2 group) and to SED pupils in core Inner City schools (SED_1 group). Three groups of NON-SED pupils studying in the same classes as the SED pupils were included at each grade level.

A battery of English and mathematics tests and a motivation and self-concept inventory were administered to all the pupils. A French test was included for the grade 4 pupils.

The main findings for grade 1 were as follows: (1) There were no significant differences among the SED_1, SED_2 and SED_3 groups on any of the tests. (2) All three SED groups scored significantly lower than the corresponding NON-SED groups on three English tests. The SED_1 group also scored significantly lower than the corresponding NON-SED group on one mathematics test. (3) There were no significant differences between the SED_3 group and the corresponding NON-SED group on the motivation and self-concept inventory.

The main findings for grade 4 were as follows: (1) There were no significant differences among the SED_1, SED_2 and SED_3 groups on the English and mathematics tests. (2) The SED_1 group scored significantly lower than the SED_2 and SED_3 groups on the French test. (3) The SED_2 and SED_3 groups scored lower thar the SED_1 group on the motivation and self-concept inventory.

(4) The SED_3 groups scored significantly lower than the corresponding NON-SED group on all the English and mathematics tests except vocabulary and mathematics concepts. Between the other SED and corresponding NON-SED groups, there were fewer significant differences.

The results of this study lead to the conclusion that the academic achievement of the SED pupils in the non-Inner City schools is generally not higher than that of the SED pupils in Inner City and core Inner City schools and that the differences between the SED and NON-SED pupils in the non-Inner City schools are more pronounced in grade 4 than in grade 1. With respect to the affective variables, the SED pupils in the non-Inner City schools do not seem to differ from their NON-SED peers. However, here differences emerge in grade 4 among the SED pupils in the three types of schools.

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Over the past thirty years, the need to raise the academic achievement of children from socio-economically and socio-culturally disadvantaged homes has been recognized as one of the most crucial issues in public schooling throughout the western world. The central thrust of the educational endeavour has been the development of special intervention programs in schools with large concentrations of disavantaged children such as projects "Head Start" and "Follow Through" in the United States (for an extensive review of such programs in a variety of countries, see Les interventions pédagogiques en milieux économiquement faibles: Expériences américaines et autres put out by the Quebec Ministry of Education in 1984).

The identification of the schools which qualify for the funds necessary to implement these programs depends on each country's definition of its disadvantaged population. It was this issue which led the School Council of the Island of Montreal to commission a study aimed at delineating those districts in the Montreal area in which conditions associated with poverty prevail (Depatie, Lefebvre and Parent, 1974). The schools which serve the children from these areas, often referred to as Inner City schools, are the ones which have been allotted special budgets for programs such as pre-kindergarten classes, teacher aides and extra educational materials.

However, not all of Montreal's socio-economically disavantaged (hereafter SED) families live within the boundaries of the poverty districts. Moreover, the population in a given school is often drawn from a variety of communities. The student body in such schools is, therefore, heterogeneous with respect to its socio-economic composition. The SED pupils in these schools do not benefit from the special programs that their peers in the

Inner City schools receive. It has been argued that the environment is in itself sufficient to raise the academic achievement of the SED pupils in these schools, but is this indeed the case? Furthermore, it must be asked whether the contact with children from middle class homes, who are in many ways so much more privileged than their SED peers, does not have an averse effect on the latters' self-image.

Review of the Literature

Most of the research pertaining to disadvantaged children in non-Inner City schools has been conducted in the United States. Its purpose was to assess the effect of desegregation on the academic achievement and self-image of black children. Many of the studies report that black pupils in integrated schools scored significantly higher on standardized tests than those who attended segregated schools (Anderson, 1966; Coleman et al., 1966; Stallings, 1959; Sullivan, 1968). Moreover, longitudinal studies show substantial gains in the achievement of blacks in desegregated schools, not only by comparison to previous achievement, but also by comparison to grade equivalent scores (Hansen, 1960; Luneman, 1972; Mayer et al., 1974).

Another issue which was extensively investigated was the relationship between the achievement of black pupils and racial composition of both the school and the classroom. McPartland (1969) found that the academic achievement of blacks was directly related to the percentage of white pupils in the classroom and unrelated to the racial composition of the school. On the other hand, Cohen, Pettigrew and Riley (1972) note that the positive correla-

tion between the black pupils' achievement scores and the racial composition of the classroom was upheld only when the overall proportion of whites in the school was at least 40%.

Comparisons between the achievement of black pupils and that of white pupils have also been carried out. Hansen (1960) found that the white pupils' scores were always higher than those of the black pupils. However, the gains made by the latter over a five-year period were greater than those attained by the white pupils. Similar results were reported by Stallings (1959). However, both studies must be accepted cautiously because of methodological issues. Bradley and Bradley (1977) note that, in Hansen's study the tests used in the pre- and post-assessments were not the same, while in Stallings study, there was no control for IQ and socio-economic status.

In conclusion, the studies pertaining to the achievement of black pupils in desegregated schools seem to indicate that these pupils' academic performance benefits from the environment, but that the racial composition of both school and classroom do seem to limit this effect.

With respect to the pupils' self-image, the results are less positive and often contradictory. Bachman (1970) and Powell and [illegible] found that black pupils in desegregated schools had lower self esteem than black pupils in segregated schools. Coleman et al. (1966) reported, moreover, that, as the percentage of white pupils in a school increased, the self-esteem of both white and black pupils in the school decreased. On the other hand, Williams and Byars (1968) as well as Knight, White and Taff (1972) found no differences between the self-esteem of black pupils

in segregated schools and that of their peers in the desegregated schools.

In Canada, the research related to the academic achievement of pupils from different ethnic backgrounds has centered predominantly around the development of second language skills. The studies conducted in Montreal are of special interest here as they deal specifically with the integration of ethnic minority pupils into the French medium schools. (Adiv, 1982; Adiv and Doré, 1983, 1984a & b). These studies reveal that the ethnic minority pupils' academic performance,as measured on standardized mathematics tests, does not differ significantly from that of their francophone peers. However, their French language skills continue to lag even after a number of years in the French school milieu.

In addition, a large-scale study has recently been conducted in the French medium schools of the Catholic School Commission of Montreal (C.E.C.M.) in order to assess the effect of a special intervention program (Opération Renouveau) on the academic achievement and self-image of pupils in Inner City schools (Houle et al., 1983). Thirty-six schools were included in the study. One third of the schools were Inner City schools participating in the Opération Renouveau program. The others were grouped as either "average" or "above average" with respect to socio-economic level. The results of the study show that, at all the levels tested (grades 1, 2, 3 and 4), there were marked differences among the three groups in academic achievement (French language skills and mathematics) and only very small differences on the measures of the self-image. Since the study was conducted over a two-year period, the findings suggest that this pattern is quite consistant. The findings pertaining to the pupils' self-image are of particu-

lar interest since once would expect low academic achievement to have a more negative effect on pupils' self-image as they get older. It is, of course, possible that these findings are upheld only in settings where the student population is homogeneous with ressect to socio-economic background. In fact, the study does not examine the questions that have been raised above with regard to SED pupils in non-Inner City schools. This may not be an issue for a school board like the C.E.C.M. where pupils, for the most part, are able to attend neighborhood schools. It is, however, a matter of concern for the Protestant School Board of Greater Montreal (P.S.B.G.M.) where most schools serve pupils from widely spread geographical areas.

Purpose of the Study

The present study constitutes the first part of a longitudinal research aimed at assessing the academic achievement and affective characteristics of SED pupils in the English medium schools of the Protestant School Board of Greater Montreal (P.S.B.G.M.) where the student population is heterogeneous with respect to socio-economic background. The precise questinns that this study will address are the following:

(1) Do SED pupils who attend schools which are socio-economically heterogeneous reach higher levels of academic achievement than SED pupils who attend Inner City schools?

(2) Does the self-image of SED pupils in socio-economically heterogeneous schools differ from that of SED pupils in Inner City schools?

(3) Do SED pupils who attend socio-economically heterogeneous classes reach the same level of academic achievement as the non-SED pupils who attend the same classes?

(4) Does the self-image of SED pupils in socio-economically heterogeneous classes differ from that of the non-SED pupils who attend the same classes?
(5) Does the proportion of SED pupils in the socio-economically heterogeneous classes affect the academic achievement and self-image of these pupils?

Methodology

The Schools

Nine schools participated in this study. All the schools belonged to the English sector of the P.S.B.G.M. According to the norms established by the School Council of the Island of Montreal, three of the schools were core Inner City schools, three were Inner City schools (but not core) and three were non-Inner City schools. The core Inner City schools have the heaviest overall concentration of SED pupils and the bulk of the funding allotted to Inner schools is, therefore, given to these schools. In contrast, Inner City schools receive only a small proportion (15%) of the total Inner City budget, in spite of the fact that the number of SED pupils in these schools is quite significant. In consequence, the scope of the intervention programs and special projects, which are offered in the latter schools, is quite limited. It should be noted that the variety of programs as well as their intensity are adapted, in-as-far as possible, to the needs of each school; hence, there is a certain amount of variability not only between core Inner City and Inner City schools, but also within each of these groups. This factor is particularly salient with regard to the pre-kindergarten classes. The distribution of the pre-kindergarten classes in the schools which participated in this study was as follows:

(1) In the core Inner City schools, two of the three schools had a half-day pre-kindergarten program and one school had a full-day pre-kindergarten program.
(2) In the Inner City schools, two of the schools had a half-day pre-kindergarten program and the third school had no pre-kindergarten program at all.

In addition to the pre-kindergarten programs, all of the core Inner City schools and all of the Inner City schools had nutrition programs, extra educational materials, teacher aides, subsidized field trips, cultural enrichment programs and special teacher/parent initiated projects. All of these programs were much more extensive in the core Inner City schools than in the Inner City schools.

The non-Inner City schools did not have any of these programs, except for a half-day pre-kindergarten program in one of the schools and the latter was not supported by Inner City funds.

The Subjects

Five hundred forty seven pupils participated in this study. Two hundred eighty-six of them were grade 1 pupils and the remainder were grade 4 pupils (for exact sample sizes according to the type of school, see tables 1A and 14A). At each grade level, the pupils were divided into two groups: SED pupils and non-SED pupils. The identification of the SED pupils was done in conjunction with each individual school and was based on a number of factors which have been shown to be powerful indicators of socio-economic status (Depatie, Lefebvre and Parent, 1974).

In order to study the effect of the environment on the academic achievement and self-image of the SED pupils, the classes at each grade level were grouped once according to school profile (core Inner City school, Inner City school and non-Inner City school) and once according to the proportion of SED pupils within each class, irrespective of school profile (SED concentration). The following criteria were used for the latter classification: (1) 80% - 100% SED pupils per class; (2) 55% -79% SED pupils per class and (3) less than 55% SED pupils per class.

In all, there were three groups of SED pupils and three groups of non-SED pupils in each type of classification. These groups will be identified, hereafter, as follows:

(1) Classification according to profile.

SED_1 = SED pupils in core Inner City schools

SED_2 = SED pupils in Inner City schools

SED_3 = SED pupils in non-Inner City schools

$NON\text{-}SED_1$ = NON-SED pupils in core Inner City schools

$NON\text{-}SED_2$ = NON-SED pupils in Inner City schools

$NON\text{-}SED_3$ = NON-SED pupils in non-Inner City schools

(2) Classification according to SED concentration within each class.

SED_1 = SED pupils in classes with 80% - 100% SED pupils

SED_2 = SED pupils in classes with 55% - 79% SED pupils

SED_3 = SED pupils in classes with less than 55% of SED pupils

$NON\text{-}SED_1$ = NON-SED pupils in classes with 80% - 100% SED pupils

$NON\text{-}SED_2$ = NON-SED pupils in classes with 55% - 79% SED pupils

$NON\text{-}SED_3$ = NON-SED pupils in classes with less than 55% SED pupils

The above grouping reveals some interesting information regarding the distribution of SED pupils across the schools. First, only one core Inner City school had a very high concentration of SED pupils in all the classes tested (grades 1 and 4). Second, only one of the non-Inner City schools had a relatively low concentration of SED pupils in all the classes tested (grades 1 and 4). Third, within the total sample, there are higher concentration of SED pupils in grade 1 than in grade 4 (for further details, see Tables 1B and 14B).

In addition to socio-economic status, ethnic background and mother tongue were also considered as possible influencing factors on the pupils' academic achievement and self-image. In particular, it was felt that English language skills might be affected if children spoke a language other than English in the home. The data shows that only 13% of the pupils in the core Inner City schools (15% in grade 1 and 10% in grade 4) did not speak English as their mother tongue. This proportion rose to 36% in the Inner City schools (29% in grade 1 and 42% in grade 4) and reached 38% in the non-Inner City schools (35% in grade 1 and 42% in grade 4). Thus, the core Inner City schools had significantly more native English speakers in their classes than the other two types of schools. Moreover, the non-native English speakers were not evenly distributed across the schools. In two of the schools, all the pupils in the grades included in the study were native English speakers. On the other hand, there was one school in which only 20% of the pupils in these grades spoke English as their mother tongue and 80% were non-native English speakers. This extreme diversity in the linguistic and cultural background

of the student population in our sample is a characteristic of the P.S.B.G.M. schools in general and it was, therefore, impossible to hold the mother tongue factor constant across the three groups of schools. It should, however, be noted that the proportion of native and non-native English speakers was, in most cases, fairly evenly divided between the SED and non-SED pupils in each class.

The Instruments

Three types of instruments were used at each of the two grade levels: (1) a battery of achievement tests to assess English language and mathematics skills; (2) a self-concept and motivation inventory and (3) a test of non-verbal ability. In addition, a French listening comprehension test was included for the grade 4 pupils. Each test is briefly described below.

(1) The English language and mathematics tests.

The Canadian Tests of Basic Skills (CTBS, Nelson, 1981) were used to assess English language and mathematics skills. Level 7 of the Primary battery was used in grade 1 and level 10 of the Multilevel Edition (metric version) was used in grade 4.

A. The Grade 1 Tests

A special feature of the grade 1 tests is that the stimulus items on many of the tests are read out aloud. This provision minimizes the influence of the learner's reading skills on the test results. It is this consideration which motivated the choice of the tests used in the present study. These tests were as follows: listening, word analysis, reading, spelling, usage,

mathematics concepts, mathematics problems and mathematics computation. The format for all of theses tests was a multiple-choice one. Each test is briefly described below.

The listening comprehension test. This test contains 32 items. Each item consists of a statement or short story followed by a question. The four possible answers are depicted pictorially.

The word analysis test. This test contains two parts. In part I (29 items), the tester reads a word and the pupils have to identify a corresponding word on their answer sheets on basis of initial and final sounds. Fourteen of the answers are presented entirely in picture form and fifteen answers are presented in written form. In part II (20 items), the tester reads a word and asks the pupils to substitute a letter and identify the newly formed word on their answer sheets. Here the answer sheets contain the word, the letter to be substituted and a pictorial representation of the new word.

The reading test. Among the tests administered in grade 1, the reading test was the only one which required extensive reading. The test is divided into three subtests. In the first subtest (27 items), the pupils are shown pictures and have to either answer yes/no questions or complete statements pertaining to what they see. In the second subtest (16 items), the pupils again have to answer yes/no questions, however, there is no pictorial support here. In the third subtest, the pupils have to read five short stories and answer questions (23 in all). Except for the initial instructions on each

subtest, the tester does not read out any part of this test.

The spelling test. The spelling test consists of 27 items. For each item, the tester reads out the three words shown on the pupils' answer sheets and then reads a sentence which contains those words. The pupils have to identify the word (amongst the three) that is misspelled.

The usage test. On this test, the pupils are given three sentences, two grammatically incorrect ones and one correct one. The tester reads the sentences out aloud and the pupils have to identify the correct one. In all, there are 24 items on this test.

The mathematics concepts test. This test consists of 33 items. It contains geometrical figures, numerical configurations, concepts relating to the identification of money (coins) and time (full hour only).

The mathematics problems. This test contains 22 problems requiring either addition or subtraction. The problems are read out aloud and only the answers are shown in written form. The answer for most of the items does nor exceed the numeral 10.

The mathematics computation. For this test, the stimulus items (26 in all) are presented orally and in written form. All the computations involve either addition or subtraction.

B. The Grade 4 Tests

The grade 4 tests of the CTBS battery follow basically the same pattern as those used in grade 1. However, at this grade level, the stimulus items are not given orally except in the case of spelling. Moreover, there are no listening and word analysis tests for this grade.

In the present study, the entire battery of English language and mathematics tests were administered in grade 4. They include the following subtests: vocabulary, reading, spelling, capitalization, punctuation, usage and the three mathematics tests: concepts, problem solving and computation. It should be noted that the reading test contains only full texts which vary in length from approximately 50-250 words. Each text is again followed by several questions with multiple-choice answers.

(2) The Self-Concept and Motivation Inventory (SCAMIN)

This inventory developed by Milchus, Farrah and Reitz (1968) provides a profile of how a pupil perceives his or her role as a learner and his or her expressed need to achieve in school. The inventory consists of a number of statements (24 for grades 1-3 and 48 for grades 4-6) to which the pupils have to respond by indicating on a scale from 1-5 how happy each statement would make them. The scale itself is given to the pupils in the form of five different faces going from very happy to very sad. The pupils' responses are grouped into four categories: role expectancy, self-adequacy, achievement needs and achievement investment. The first two categories make up the self-concept profile and the last two categories indicate the

motivation profile. It should be noted that the self-concept profile refers to a pupil's self-concept in relation to school (academic self-concept). It gives an indication as to how the pupil accepts the expectations others have of him (role expectation) and how he or she views his or her chances of success.

(3) The Non-Verbal Ability Test

The test used for the assessment of non-verbal ability was Raven's Progressive Matrices test. This test is designed to assess a person's ability to "observe and think clearly" (Raven, 1965, p3). The test contains several sections. Each section contains a number of pattern completion tasks which increase progressively in complexity. Two versions of the test are available: a colored version for the elementary grades and a standard version for older children and adults. Since the test does not require language skills, it is particularly suitable in situations where the language of instruction may not be the mother tongue of all the children. It is with this issue in mind that the test was used in the present study (coloured version in grade 1 and standard version, sections A,B,C and D, in grade 4).

(4) The French Listening Comprehension Test

Since there are no standardized French tests for grade 4, it was decided to use the scores that the pupils participating in this project had received on a listening comprehension test in grade 3. This test is a French second language test prepared by the ministère de l'Education. It contains 28 multiple-choice items. The instructions for the test are given in English and the entire test is tape recorded.

Administration Procedures

All the grade 1 and grade 4 classes in the nine schools were given the full battery of tests. In order to disturb classroom routines as little as possible, the tests were administered to all the pupils in a given class. However, the test results of pupils with severe learning disabilities and those of non-native English speakers who had been in the country for less than two years were excluded from the data analysis.

The tests were administered in May 1985 except for the grade 4 CTBS which were administered in February of that same year. All the tests were given by native English speakers who were especially trained for the specific tasks they had to perform.

Procedures for the Analysis of the Data

The results were analysed once according to school profile (core Inner City, Inner City and non-Inner City) and once according to SED concentration (80% - 100%, 55% - 79% and less than 55% SED pupils in the class). A 2 X 3 factorial design was used for the analysis according to school profile. The variables were SED versus non-SED grouping and school profile. Separate analyses were carried out for each test and at each grade level. Wherever significant main effects were noted, a one-way analysis of variance and a Newman Keuls procedure of multiple comparisons were used to determine which groups differed significantly from one another.

Because of the 80% - 100% SED pupils criterion in the classification of the classes according to SED concentration, there were only small numbers of non-SED pupils in these classes. In consequence, the two-way factorial

analysis was not used here and all the data for this part of the study was analysed using the one-way analysis of variance and the Newman Keuls procedure of multiple comparisons.

In order to minimize the effect of possible differences in mental capacity between the groups on the results of the various academic tests, the scores of the Progressive Matrices tests were analyzed first. Wherever significant differences between the groups emerged from this analysis, the Progressive Matrices scores were used as a covariate in the analysis of the results obtained from the academic tests (for a brief description of this procedure, see Appendix I).

In addition, the raw scores from the CTBS and from the SCAMIN were transfurmed into grade equivalents and stanine scores respectively (see Appendix II and Appendix III for descriptions). Norm-based comparisons were then carried out between the six groups at each grade level.

Results

Grade 1

Results of the Analysis According to School Profile.

The results of the factorial analysis of variance disclose significant differences between the SED and NON-SED groups on the Progressive Matrices test scores. Hence a covariance procedure was used in the subsequent two-way analyses for the grade 1 test scores. The results of these analyses reveal no significant main effect for school profile. Thus, the SED_1, SED_2 and SED_3

groups did not differ significantly from one another on any of the tests (for the mean scores obtained by each group, see Table 2). Between the SED and NON-SED groups there were significant differences on three English language tests, word analysis ($F = 8.45$, $p < .01$, $df = 1,245$), reading ($F = 13.94$, $p < .001$, $df = 1,255$) and usage ($F = 10.76$, $p < .01$, $df = 1,225$) and on one mathematics test ($F = 7.89$, $p < .01$, $df = 1,244$). Moreover, there was a significant difference between these groups on the motivation dimension of the SCAMIN ($F = 8.69$, $p < .01$, $df = 1,260$). There were no significant interactions between SED versus NON-SED grouping and school profile.

Since the factorial analysis had revealed significant differences among the groups on the Progressive Matrices scores, these scores were reanalysed with a simple analysis of variance to determine which groups differed significantly from one another. The results show that the only groups who were affected by this factor were the two groups in the core Inner City schools (SED_1 and $NON\text{-}SED_1$). In consequence, a covariance procedure was used in the follow-up comparisons of these groups. On the other hand, the comparisons between the other SED and NON-SED groups were based on a simple analysis of variance.

The results of all these analyses indicate that in all three types of schools (core Inner City, Inner City and non-Inner City), the SED pupils scored significantly lower than the NON-SED pupils on the word analysis test, the reading test and the usage test (for the numerical values of the scores see Tables 3, 4 and 5). Moreover, in the core Inner City schools, the SED group scored significantly lower than the NON-SED group on the problem solving

test (SED_1, $\bar{X}$ = 9.80; $NON\text{-}SED_1$, $\bar{X}$ = 12.59). On the motivation scale, the SED_1 group ($\bar{X}$ = 46.38) and the SED_2 group ($\bar{X}$ = 47.76) scored significantly lower than the corresponding NON-SED groups ($NON\text{-}SED_1$, $\bar{X}$ = 49.32; $NON\text{-}SED_2$, $\bar{X}$ = 50.27). Between the SED_3 and $NON\text{-}SED_3$ groups (non-Inner City schools), there was no significant difference on this variable.

It is also noteworthy that,although there were no significant differences between the SED and NON-SED groups on any of the other tests, the scores of the SED groups on all of these tests were numerically always lower than those of the NON-SED groups.

The grade equivalent scores indicate the same pattern as the one noted in the analysis of the raw scores. However, the differences between the SED_1 and $NON\text{-}SED_1$ groups are much more pronounced here since the effect of the difference in non-verbal capacity has not been held steady (see Table 6).

According to standardized norms, the grade 1 pupils should have been at a grade level of about 19 since they were tested in May. The results suggest that the NON-SED groups performed within a two to three months range of this level except for the listening comprehension test on which the three groups scored markedly below grade level. The SED groups on the other hand, performed two to six months below grade level except in computation where all the groups scored at/or above grade level.

Since the stanine norms for the SCAMIN are given according to the four categories which make up the inventory, the stanine scores for the SCAMIN results of the present study have been calculated according to these four categories. The results show that the groups differed by no more than one

stanine point from each other except in the case of achievement investment where there was a difference of two points between the SED_1 and $NON\text{-}SED_1$ groups. Moreover all six groups ranked within the average range of the stanine scale (see Table 7).

Results of the Analysis According to SED Concentration

Here, again, the scores of the Progressive Matrices test were analysed first. The results reveal no significant differences among the groups and, therefore, a simple analysis of variance procedure was used for the statistical analysis of the other test scores.

The comparison of the SED_1, SED_2 and SED_3 pupils grouped according to SED concentration shows the same absence of significant differences noted in the analysis according to school profile with one noteworthy difference: the SED_1 group scored significantly higher on the reading test ($\bar{X}$ = 32.87) than the SED_3 groups ($\bar{X}$ = 26.12). The SED_2 group ($\bar{X}$ = 28.86) also scored numerically higher than the SED_3 group. However this difference was statistically not significant (for the numerical values of the other test scores, see Table 8).

The comparison of the SED and NON-SED pupils indicates that the three SED groups scored numerically lower than the corresponding NON-SED groups on all the English and mathematics tests. The statistical analysis reveals, however, that in the case of the two categories with lower concentrations of SED pupils, these differences were only significant on the reading test (for the $SED_2/NON\text{-}SED_2$ groups as well as for the $SED_3/NON\text{-}SED_3$ groups) and

on the usage test (for the SED_2/$NON\text{-}SED_2$ groups only). In contrast, the SED_1 group (SED concentration 80% - 100%) scored significantly lower than the $NON\text{-}SED_1$ group on all the English and mathematics tests (for the numerical values of the scores see Tables 9, 10 and 11).

Futhermore, both the SED_1 group ($\bar{X}$ = 46.73) and the SED_2 group ($\bar{X}$ = 48.03) scored significantly lower than the $NON\text{-}SED_1$ group ($\bar{X}$ = 50.58) and the $NON\text{-}SED_2$ group ($\bar{X}$ = 50.19) on the motivation scale. The SED_3 and the $NON\text{-}SED_3$ groups obtained practically the same score here. There were no significant differences between any of the groups on the self-concept variable.

The grade equivalent scores reveal again the same overall pattern noted in the analysis of the raw scores (see Table 12). As in the case of the " by profile " analysis, the grade equivalent scores of the $NON\text{-}SED_1$ group were consistently higher than those of all the other groups. Furthermore, the SED_1 group performed at a somewhat higher level than the SED_2 group on the listening comprehension test, on the reading test and on the usage test. The grade equivalent scores of the SED_1 group on the reading test were also noticeably higher than those of the SED_3 group, a difference already noted in the statistical analysis of the raw scores.

In terms of the standardized norms, the three SED groups performed three to six months below grade level on the English tests. The SED_1 and SED_2 groups also performed below grade level on two of the mathematics tests. The NON-SED groups performed at/or above average on the mathematics tests. The performance of the $NON\text{-}SED_1$ group on the English language tests was also at/or above grade level. In contrast, the performance of the $NON\text{-}SED_2$ and

NON-SED_3 groups was two to five months below grade level on several of the English tests.

The stanine scores on the SCAMIN are very similar to those noted in the "by profile" analysis and all the groups ranked again within the average range of the stanine scale (see Table 13).

Grade 4

Results of the Analysis According to School Profile

The factorial analysis of the grade 4 test results according to school profile reveals no significant differences on the Progressive Matrices test. However, on practically all the other tests there were significant main effects. First, the SED groups differed significantly from the NON-SED groups on all the English tests, the mathematics tests and on the self-concept scale (on the vocabulary test, the level of significance was, however, very low). Second, on the French test and on the self-concept scale there were significant differences among the three types of schools (core Inner City, Inner City and non-Inner City). On the latter two tests, the interaction between the variables was also significant (for the exact F values see Table 15).

Thus, as in the case of grade 1, there were no significant differences between the SED_1, SED_2 and SED_3 groups on the English and mathematics tests. Similarly, there were no differences between these groups on the motivation scale (see Table 16 for the mean scores obtained by each group).

Further analysis of the French test results reveals that the SED_1 group ($\bar{X}$ = 14.46) scored significantly lower than the SED_2 group ($\bar{X}$ = 20.97)

and the SED_3 group ($\bar{X}$ = 22.08) and there was no significant difference between the latter two groups on this test.

On the self-concept scale, the pattern was reversed, i.e. the SED_1 group ($\bar{X}$ =87.20) obtained a significantly higher score than the SED_2 group ($\bar{X}$ =80.83). The score of the SED_3 group ($\bar{X}$ =83.87) was also lower than that of the SED_1 group but the difference was statistically not significant.

The comparison of the SED and NON-SED pupils in the three types of schools indicates that the numerical values of the test scores obtained by the SED pupils were consistently lower than those of the NON-SED pupils. However, in terms of statistical significance, the pattern varied according to school profile. The largest number of significant differences was found in the non-Inner City schools. In fact, the SED_3 group scored significantly lower than the $NON\text{-}SED_3$ group on all the English and mathematics tests except for vocabulary and mathematics concepts (see Table 19). In the core Inner City schools, the SED_1 pupils scored significantly lower than the $NON\text{-}SED_1$ pupils on three English tests and on the three mathematics tests. Moreover, the level of significance on the English tests was much lower here than in the non-Inner City schools (see Table 17). Finally, the SED_2 group (Inner City schools) differed from the $NON\text{-}SED_2$ group on only two tests: punctuation and problem solving (see Table 18). Closer examination of the data discloses that this pattern was partially caused by one Inner City school where the NON-SED pupils scored somewhat lower than the SED pupils. The test scores of the Inner City schools were therefore, reanalyzed excluding this particular school. The results reveal a pattern very similar to that noted in the core Inner City schools, i.e. significant differences

between the SED and NON-SED groups on two English tests (reading: SED_2, $\bar{X}$ = 21.62; $NON\text{-}SED_2$, $\bar{X}$ = 27.00; capitalization: SED_2, $\bar{X}$ = 16.25; $NON\text{-}SED_2$, $\bar{X}$ = 20.06) and on the three mathematics tests (concepts: SED_2, $\bar{X}$ = 16.73; $NON\text{-}SED_2$, $\bar{X}$ = 20.55; problem solving: SED_2, $\bar{X}$ = 12.05; $NON\text{-}SED_2$, $\bar{X}$ = 16.05; computation: SED_2, $\bar{X}$ = 28.56; $NON\text{-}SED_2$, $\bar{X}$ = 32.82). Furthermore, there was a significant difference between the SED_2 and $NON\text{-}SED_2$ pupils on the self-concept scale (SED_2, $\bar{X}$ = 80.63; $NON\text{-}SED_2$, $\bar{X}$ = 87.06).

The grade equivalent scores also indicate that the three SED groups did not differ significantly from one another and that all three groups scored consistently below the NON-SED groups. The differences were particularly large (varying from three to eight months) between the SED_1 and $NON\text{-}SED_1$ groups and between the SED_3 and $NON\text{-}SED_3$ groups (see Table 20).

In terms of standardized norms, the grade 4 pupils should have been at a grade equivalent level of 46 since they were tested in February. The results obtained reveal that the NON-SED pupils performed within a two to three months range of the expected grade level except in spelling, mathematics concepts ($NON\text{-}SED_1$ only) and computation where the level was five to nine months above average. The SED groups, on the other hand, scored at/or below grade level except in computation where they scored two to three months above grade level. It is especially noteworthy that the SED pupils in the non-Inner City schools scored seven months below grade level on punctuation and problem solving and ten months below grade level on the language usage test.

The stanine scores for the SCAMIN results show that all the groups ranked within the average range of the stanine scale except for the $NON\text{-}SED_1$

group which ranked one step above average for the goal and achievement needs category (see Table 21). It should also be noted the SED_1 pupils obtained a stanine score of 6 on all the categories except self-adequacy (stanine 5) whereas the SED_2 and SED_3 pupils obtained a stanine score of 5 on three of the four categories. Similarly, the $NON\text{-}SED_1$ groups obtained a higher stanine score than the $NON\text{-}SED_2$ and $NON\text{-}SED_3$ groups on all the categories except in the case of achievement investment.

Results of the Analysis According to SED concentration.

The analysis of the grade 4 results groups according to concentration shows, once again, no significant differences between the groups on the Progressive Matrices scores, hence, here too, a simple analysis of variance procedure was used to analyze the results of the other tests.

The comparison between the SED_1, SED_2 and SED_3 groups shows the same absence of significant differences on the English and mathematics tests as in the "by profile" analysis (for details see Table 22). On the French tests, the SED_3 group ($\bar{X}$ = 22.59) scored significantly higher than the SED_1 group ($\bar{X}$ = 17.08) and the SED_2 group ($\bar{X}$ = 16.71). Between the latter two groups, there was no significant difference. In contrast, the SED_2 group received a significantly higher score on the motivation scale ($\bar{X}$ = 101.50) than the SED_3 group ($\bar{X}$ = 97.55). The score of the SED_1 group was numerically also higher ($\bar{X}$ = 99.73) than that of the SED_3 group. However, this difference was statistically not significant.

The results of the analysis pertaining, to the comparison of the SED and NON-SED pupils in the three SED concentration categories disclose that the SED_3 pupils (less than 55% SED pupils in the class) scored significantly

lower than the NON-SED_2 pupils on all the English and mathematics tests (see Table 25). In contrast, the SED_1 pupils (80% - 100% SED concentration) scored significantly lower than their NON-SED peers on only three English language tests (capitalization, punctuation and usage) and on the problem solving test in mathematics (see Table 23). Between the SED_2 and NON-SED_2 pupils (55% - 79% SED concentration) there were no significant differences at all on the English and mathematics tests (see Table 24). However, here again the results were affected by the fact that the scores of the NON-SED pupils in one of the classes were lower than those of their SED peers. A reanalysis of the results of these two groups, excluding those of the pupils in that specific class, reveals, that here too, there were a number of significant differences. Two of these pertain to the English tests (reading: SED_2, $\bar{X}$ = 21.54; NON-SED_2, $\bar{X}$ = 27.12; usage: SED_2, $\bar{X}$ = 14.29; NON-SED_2, $\bar{X}$ = 18.38) and the others pertain to the three mathematics tests (concepts: SED_2, $\bar{X}$ = 16.92; NON-SED_2, $\bar{X}$ = 20.76; problem solving: SED_2, $\bar{X}$ = 11.08; NON-SED_2, $\bar{X}$ = 14.76; computation: SED_2, $\bar{X}$ = 27.67, NON-SED_2, $\bar{X}$ = 33.59).

On the motivation scale, there were no significant differences between any of the SED and NON-SED groups. On the other hand, on the self-concept scale, the SED_1 group ($\bar{X}$ = 83.92) and the SED_2 group ($\bar{X}$ = 85.76) scored significantly lower than the NON-SED_1 group ($\bar{X}$ = 92.63) and the NON-SED_2 group ($\bar{X}$ = 90.74).

The grade equivalent scores show the same pattern that has been noted in the discussion of the grade equivalent scores grouped by school profile. Here, again, the NON-SED groups performed generally within a two to three months range of the expected grade level (46). However, there were more instances here where the NON-SED groups, particularly the NON-SED_1 group,

performed markedly above this level (for details see Table 26). The SED groups performed one to four months below grade level except in mathematics computation where the grade equivalent scores of all three SED groups were at (SED_2 group) or above (SED_1 and SED_3 groups) the expected grade level.

The stanine scores on the SCAMIN inventory indicate that the SED_2 group scored one point higher here than in the "by profile" classification on three categories: goal and achievement needs, achievement investment and role expectations. The scores of the SED_1 and SED_3 groups did not differ from those recorded in the "by profile" results (compare Table 21 and Table 27). In general, the groups ranked within the average range of the stanine scale. However, the SED_2 group ranked one step above average on the achievement investment category and the NON-SED_1 and NON-SED_2 groups ranked one step above average on the achievement and goal needs. Moreover, the pupils in the groups with an SED concentration of more than 55% scored one stanine point higher than the pupils in the below 55% SED concentration group on goal and achievement needs and on role expectations.

Summary and Conclusion

The results of the grade 1 tests can be summarized as follows:

1. Comparison Between SED_1, SED_2 and SED_3 Groups

   There were no significant differences among the three SED groups on the English and mathematics tests when the pupils were grouped according to school profile (core Inner City, Inner City and non-Inner City schools). However, when the classification was based on the concentration of SED

pupils in the class, the SED_3 group (less than 55% SED pupils in the class) was significantly weaker in reading than the SED_1 group (80% - 100% SED pupils in the class). There were no significant differences among the three groups in motivation and self-concept.

2. Comparison Between SED and NON-SED Groups.

The three SED groups scored significantly lower than the corresponding NON-SED groups on three English tests: word analysis, reading and usage when the classification was based on school profile. Moreover, the SED_1 group (core Inner City schools) scored significantly lower than the NON-SED group on the problem solving test. In the analysis according to SED concentration, the difference between SED and NON-SED groups are more pronounced in the classes with an 80% - 100% concentration of SED pupils, whereas for the others, reading is the only variable on which the differences between the SED and the NON-SED pupils are consistently significant. On the motivation scale, the SED_1 and the SED_2 pupils scored significantly lower than the $NON\text{-}SED_1$ and the $NON\text{-}SED_2$ pupils. There was no significant difference between the SED_3 and $NON\text{-}SED_3$ groups on this variable.

3. Grade Equivalent Scores.

The NON-SED groups performed within a two to three months range of the expected grade level. The SED groups performed three to six months below grade level except in computation where all the groups scored at/or above grade level.

The results of the grade 4 tests can be summarized as follows:

1. Comparison Between the SED_1, SED_2 and SED_3 Groups

   In both types of classifications (by profile and by SED concentration), there were no significant differences between the three SED groups on the English and mathematics tests. In French, the SED_1 group scored significantly lower than the SED_2 and SED_3 groups. The SED_1 group scored significantly higher than the SED_2 group on the self-concept scale when the grouping was according to school profile. The SED_2 group scored significantly higher than the SED_3 group on the motivation scale when the grouping was based on SED concentration.

2. Comparison Between SED and NON-SED Groups

   In the " school profile " classification, the SED_3 group scored significantly lower than the $NON\text{-}SED_3$ group on all the English and mathematics tests except vocabulary and mathematics concepts. Differences between the SED_1 and $NON\text{-}SED_1$ groups were significant on only three English tests and on the three mathematics tests. Between the SED_2 and $NON\text{-}SED_2$ groups, the differences was only significant on two tests (capitalization and problem solving). In the " SED concentration " classification, the differences between the SED_3 and $NON\text{-}SED_3$ groups were significant on all the tests, whereas the differences between the other two pairs of SED and NON-SED groups were less pronounced. On the self-concept scale, the SED_2 group scored significantly lower than the $NON\text{-}SED_2$ group according to the " school profile " classification and both the SED_1

and SED_2 groups scored significantly lower than the corresponding NON-SED groups when the classification was based on SED concentration.

3. Grade Equivalent Scores

The NON-SED groups performed within a two to three months range of the expected grade level and markedly above average in mathematics computation. The SED groups performed at/or below grade level except in computation where they scored two to three months above grade level. In some instances, the SED_3 group scored as much as seven to ten months below grade level.

Three major patterns emerge from the findings of this study. First, at both grade levels, there were practically no significant differences between the three SED groups on the English and mathematics tests. Second, at both grade levels, there were a number of significant differences between the SED and NON-SED groups on these same tests. In each case, the SED groups scored significantly lower than the NON-SED groups. Third, in grade 1, the differences between the SED and NON-SED pupils were practically the same across the three types of schools when the mental capacity factor was held constant. In contrast, in grade 4, the differences between the SED and the NON-SED pupils were more pronounced in the non-Inner City schools than in the other two types of schools.

Several findings pertaining to the pupils' academic performance are noteworthy. In grade 1, the SED pupils scored consistently lower than the NON-SED pupils on those tests that involved reading skills. A school by

school analysis of the test results [not reported in this study] reveals unusually high standard deviations from the mean on the reading test, indicating a great degree of variability in the pupils' reading ability. Indeed, some of the SED pupils scored as low as 5 or 6 (out of a maximum of 66) suggesting that there were quite a few amongst them for whom the obstacle was not the content of the other tests, but these pupils' inability to cope with the written text.

The grade equivalents underscore the weak performance of the SED pupils on all the English language tests. In terms of standardized norms, these pupils scored three to six months below the expected grade level. It should be pointed out that such comparisons must be accepted cautiously because the norms established for grade equivalents below 18 have been derived from an " assumed " growth in pupils' skills. Nevertheless, it is felt that deviations of five to six months constitute a sizable lag in knowledge and/or skills in the particular subject tested.

In contrast, the performance of the SED pupils in mathematical computation was consistently above average. It is possible that this is due, to some extent, to the fact that this test involves no language skills at all.

The performance of the grade 1 NON-SED pupils in the core Inner City schools is also remarkable. Closer examination of the grade equivalent scores shows that, except for listening comprehension, this group performed at/or above grade level. It is conceivable that these results reflect the effect of the special enrichment programs offered in the core Inner City schools. This does not imply that the SED pupils' academic performance was

not enhanced by these programs. However, it seems plausible that the NON-SED pupils, who differed significantly from the SED pupils in terms of non-verbal ability, derived greater benefits from them than the SED pupils.

The acquisition of language skills seems to be also an important factor in grade 4, but now the issue pertains to the learning of French. Surprisingly, here the differences occurred among the SED groups and not between the SED and the NON-SED groups. The finding that the SED pupils in the core Inner City schools scored significantly lower than the SED pupils in the other two types of schools may be attributable to the fact that the majority of the pupils in the core Inner City schools were native English speakers (90%). For these pupils, French was their first encounter with a language other than their mother tongue. In the Inner City and non-Inner City schools, on the other hand, almost half of the pupils (42%) spoke a language other than English as their mother tongue. For these pupils, French was a third language, a factor which may facilitate foreign language learning (Lococo, 1976). It is also possible that the neighborhoods in which the pupils from the core Inner City schools live are more predominantly English speaking than those where the pupils from the other schools live; hence there may be less opportunity for informal exposure to French in these neighborhoods.

The findings that the gap in achievement on the English tests between the SED and NON-SED pupils in the non-Inner City schools was more pronounced than that between the corresponding groups in the core Inner City and Inner City schools is more difficult to explain, although it is possible that, here too, the mother tongue factor plays a role. Closer examination of the pupils' linguistic background within each classroom reveals that, in two of the classes,

the proportion of non-native English speakers was as high as 55%. This factor certainly reduces the opportunities for contact with or among native English speakers and this, in turn, could explain why the SED pupils' performance on the language usage test was so weak. [In terms of grade equivalents, a lag of 10 months was noted here between the expected grade level and the pupils' actual achievement]. The NON-SED pupils in these classes faced, of course, the same situation, but they may have compensated for it through study since NON-SED pupils seem to gain generally more from the academic program than the SED pupils. Whether the development of the more academically oriented skills such as reading and spelling would be similarly affected remains, however, an open question.

With respect to the pupils' affective characteristics, no clear-cut pattern emerged from this study. It should be noted that the part of the test that relates to the self-concept assessment did not play a major role in grade 1 in terms of between-group differences. This may be due to the fact that the self-concept scale used in this study measures primarily school related issues [academic self-concept] and is, therefore, probably not as relevant in grade 1 as in grade 4. In contrast, motivational factors, seemed to play an important role already in grade 1 with significant differences between the SED pupils and NON-SED pupils in the core Inner City and Inner City schools. Most important for this study is the finding that the affective characteristics of the SED pupils in the non-Inner City schools did not differ significantly from those of their NON-SED peers at either grade level.

Surprisingly, the results indicate that the grade 4 SED pupils in

both the non-Inner City and Inner City schools were less motivated and had a less positive self-concept than the SED pupils in the core Inner City schools. Since the between-group differences were not consistently significant, we can only talk of a trend here. This trend, is, nevertheless, noteworthy as it does not occur in grade 1 and could, therefore, be indicative of a widening gap between the SED groups at higher grades. It seems, however, difficult to attribute this trend to the influence of contact with a socio-economically less disadvantaged milieu since this factor is not a prominant feature in the Inner City schools. It is possible that the comparatively more positive self-image of the SED pupils in the core Inner City schools reflects a certain feeling of security that these pupils may have developed as a result of the ongoing special enrichment programs they receive.

The findings pertaining to the analysis according to SED concentration at the classroom level are contradictory when the grade 1 and grade 4 results are considered simultaneously. In grade 1, the differences between the SED and NON-SED pupils are most pronounced in the category with the highest concentration of SED pupils. In contrast, in grade 4, there are noticeably more differences between SED and NON-SED pupils in the category with the lowest SED concentration than in the other categories. It is, of course, possible to claim that the pattern that emerges here reflects changes over time which may be attributable to the SED concentration factor. However, such a hypothesis must await support from longitudinal data.

Moreover, the above hypothesis would not explain why the grade 1 SED

pupils in the 80% - 100% SED concentration [illegible] higher on the reading test than the SED pupils in classes with less than 55% [illegible] tration. It is possible that these results are related to the fact that there were two grade 1 classes in the core Inner City schools which had an SED concentration of less than 55%. Since the scores of many of the pupils in these classes were quite weak, their inclusion in the less than 55% SED concentration category would lower the reading score of the entire SED groups in this category while, simultaneously, causing the reading score of the SED groups in the 80% - 100% SED concentration category to rise just enough to make the difference between the two groups significant. Thus, the proportion of SED pupils in the classroom may be less of an influencing factor than the overall proportion of SED pupils in the school, at least with respect to schools with a very high concentration of SED pupils.

In conclusion, the results of this study seem to indicate that the effect of the environment in the non-Inner City schools is in itself not powerful enough to raise the academic achievement of the SED pupils in these schools above that of the SED pupils in the Inner City schools. Moreover, the findings suggest that the gap between the SED and the NON-SED pupils in the non-Inner City schools increases by grade 4. The results also show that the self-image of SED pupils in the non-Inner City schools may change over time. It must, however, be borne in mind that this study is cross-sectional. Hence, differences between grade 1 and grade 4 may be attributable to the particular nature of the classes at

each grade level and may not necessarily reflect developmental changes.

...ll b... of interest to follow the pupils who participated in this

...h over the next few years so as to get a longitudinal view of

their academic achievement and affective characteristics.

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Table 14

Sample Sizes for Grade 1 According
to School Profile

Core Inner City Schools	SED_1	56
	$NON\text{-}SED_1$	28
Inner City Schools	SED_2	65
	$NON\text{-}SED_2$	24
Non-Inner City Schools	SED_3	66
	$NON\text{-}SED_3$	47

Table 15

Sample Sizes for Grade 1 According
to SED Concentration

80% - 100% SED	SED_1	47
	$NON\text{-}SED_1$	12
55% - 79% SED	SED_2	88
	$NON\text{-}SED_2$	38
below 55% SED	SED_3	37
	$NON\text{-}SED_3$	49

Table 2

Comparison of Test Results of SED Groups
According to School Profile
Grade 1

	SED_1	SED_2	SED_3	F ratio [a]	df
Non-verbal (36) [b]	21.37	21.34	19.84	____	____
English lang. skills					
- listening (32)	15.41	15.95	15.95	____	____
- word analysis (49)	28.81	29.32	29.38	____	____
- reading (66)	30.75	29.95	28.10	____	____
- spelling (27)	11.54	10.28	12.90	____	____
- usage (24)	10.86	9.93	10.72	____	____
Mathematics					
- concepts (33)	17.98	17.42	18.95	____	____
- problems (22)	9.80	10.20	10.50	____	____
- computation (26)	15.27	15.30	15.68	____	____
SCAMIN					
- motivation (60)	46.38	47.77	48.73	____	____
- self-concept (60)	45.37	45.55	45.18	____	____

a "____" indicates that the one way analysis of variance was not carried out following the absence of significant differences according to the factorial analysis

b Maximum scores in parentheses

Table 3

Comparison of Test Results of SED and NON-SED Groups
in Core Inner City Schools According to School Profile
Grade 1

	SED_1	$NON\text{-}SED_1$	F ratio[a,b]	df
Non-verbal (36)[c]	21.36	24.89	7.93**	1,78
English lang. skills				
- listening (32)	15.41	17.26	____	____
- word analysis (49)	26.81	32.25	3.99*	1,72
- reading (66)	30.75	41.44	5.64*	1,61
- spelling (27)	11.54	15.29	____	____
- usage (24)	10.85	13.50	4.10*	1,68
Mathematics				
- concepts (33)	17.98	20.63	____	____
- problems (22)	9.80	12.59	5.74*	1,75
- computation (26)	15.27	17.14	____	____
SCAMIN				
- motivation (60)	46.38	49.32	5.31*	1,78
- self-concept (60)	45.38	46.21	____	____

[a] "_____" indicates that the one way analysis of variance was not carried out following the absence of significant differences according to the factorial analysis

[b] Means shown represent regular raw scores, however F ratios are based on analysis of covariance

[c] Maximum scores in parentheses

*$p < .05$
**$p < .01$

Table 4

Comparison of Test Results of SED and NON-SED Groups
in Inner City Schools According to School Profile
Grade 1

	SED_2	$NON\text{-}SED_2$	F ratio	df
Non-verbal (36)[b]	21.34	21.67	0.07	1,81
English lang. skills				
- listening (32)	15.95	16.39	____	____
- word analysis (49)	29.32	32.83	4.71*	1,84
- reading (66)	29.95	35.04	4.28*	1,77
- spelling (27)	12.28	14.83	____	____
- usage (24)	9.93	11.87	4.56*	1,79
Mathematics				
- concepts (33)	17.42	19.61	____	____
- problems (22)	10.20	10.18	0.01	1,80
- computation (26)	15.30	16.78	____	____
SCAMIN				
- motivation (60)	47.76	50.27	7.50**	1,80
- self-concept (60)	45.55	45.43	____	____

[a] " _____ " indicates that the one way analysis of variance was not carried out following the absence of significant differences according to the factorial analysis

[b] Maximum scores in parentheses

*p < .05
**p < .01

Table 5

Comparison of Test Results of SED and NON-SED Groups
in Non-Inner City Schools According to School Profile
Grade 1

	SED_3	$NON\text{-}SED_3$	F ratio[a]	df
Non-verbal (36)[b]	19.84	21.96	3.63	1,99
English lang. skills				
- listening (32)	15.95	16.55	____	____
- word analysis (49)	29.38	31.64	3.97*	1,105
- reading (66)	28.10	34.23	7.13**	1,102
- spelling (27)	12.90	14.04	____	____
- usage (24)	10.72	12.43	4.63*	1,105
Mathematics				
- concepts (33)	18.95	19.59	____	____
- problems (22)	10.50	11.38	1.51	1,103
- computation (26)	15.68	17.45	____	____
SCAMIN				
- motivation (60)	48.73	48.89	0.03	1,101
- self-concept (60)	45.18	47.21	____	____

[a] "____" indicates that the one way analysis of variance was not carried out following the absence of significant differences according to the factorial analysis

[b] Maximum scores in parentheses

* $p \leq .05$
** $p \leq .01$

Table 6

Comparison of Grade Equivalent Scores on CTBS
According to School Profile
Grade 1

	Core Inner City		Inner City		Non-Inner City	
	SED_1	$NON\text{-}SED_1$	SED_2	$NON\text{-}SED_2$	SED_3	$NON\text{-}SED_3$
English lang. skills						
- listening	13	15	13	14	13	15
- word analysis	13	19	16	18	15	17
- reading	14	20	14	17	14	16
- spelling	14	21	15	19	16	17
- usage	13	19	13	16	13	17
Mathematics						
- concepts	16	20	16	17	17	18
- problems	17	20	17	17	17	19
- computation	20	21	20	22	19	22

Table 7

Comparison of Stanine Scores on SCAMIN
According to School Profile
Grade 1

	Core Inner City		Inner City		Non-Inner City	
	SED_1	$NON\text{-}SED_1$	SED_2	$NON\text{-}SED_2$	SED_3	$NON\text{-}SED_3$
Motivation						
- goal & achievement needs	5	4	4	6	4	5
- achievement investment	4	6	5	6	5	6
Self-concept						
- role expectations	5	5	5	5	4	5
- self adequacy	5	4	5	4	5	6

Table 9

Comparison of Test Results of SED Groups
According to SED Concentration[A]
Grade 1

	SED_1	SED_2	SED_3	F ratio	df
Non-verbal (36)[B]	20.71	20.18	22.55	2.47	2,169
English lang. skills					
- listening (32)	15.97	15.46	16.33	0.70	2,176
- word analysis (49)	28.93	28.95	30.30	0.56	2,170
- reading (66)	32.87	29.86	26.12	3.75*	2,154
- spelling (27)	11.50	12.51	13.09	1.42	2,167
- usage (24)	10.63	10.05	11.27	1.43	2,163
Mathematics					
- concepts (33)	17.18	18.23	19.50	2.75	2,174
- problems (22)	9.72	10.35	10.61	0.81	2,171
- computation (26)	14.94	15.66	15.73	0.38	2,174
SCAMIN					
- motivation (60)	46.73	48.03	48.29	1.22	2,166
- self-concept (60)	45.05	45.68	45.21	0.13	2,163

*$p < .05$

[A] Means joined by a line differ significantly from one another

[B] Maximum scores in parentheses

Table 9

Comparison of Test Results of SED and NON-SED Groups in Core Inner City Schools According to SED Concentration

Grade 1

	SED_1	$NON\text{-}SED_1$	F ratio	df
Non-verbal (36)[A]	20.71	22.83	1.81	1,69
English lang. skills				
- listening (32)	15.97	18.92	5.71*	1,68
- word analysis (49)	28.93	33.42	5.51*	1,66
- reading (66)	32.67	45.27	12.37***	1,54
- spelling (27)	11.50	17.17	14.33***	1,66
- usage (24)	10.63	14.00	7.65**	1,64
Mathematics				
- concepts (33)	17.18	20.42	6.13*	1,70
- problems (22)	9.72	12.42	7.43**	1,70
- computation (26)	14.94	18.00	4.07*	1,71
SCAMIN				
- motivation (60)	46.73	50.58	4.57*	1,66
- self-concept (60)	45.05	47.46	1.09	1,65

[A] Maximum scores in parentheses

*p <.05
**p <.01
***p <.001

Table 10

Comparison of Test Results of SED and NON-SED Groups
in Inner City Schools According to SED Concentration
Grade 1

	SED_2	$NON\text{-}SED_2$	F ratio	df
Non-verbal (36)[a]	20.17	21.43	1.36	1,113
English lang. skills				
- listening (32)	15.46	16.16	0.73	1,120
- word analysis (49)	28.95	31.08	2.62	1,119
- reading (66)	28.86	35.75	7.29**	1,113
- spelling (27)	12.51	14.16	2.67	1,116
- usage (24)	10.05	11.68	5.15*	1,114
Mathematics				
- concepts (33)	18.23	19.35	1.34	1,118
- problems (22)	10.35	10.36	0.01	1,115
- computation (26)	15.66	16.73	0.89	1,118
SCAMIN				
- motivation (60)	48.03	50.19	6.64*	1,113
- self-concept (60)	45.66	46.67	0.79	1,110

[a] Maximum scores in parentheses

*$p < .05$
**$p < .01$

Table 11

Comparison of Test Results of SED and NON-SED Groups in Non-Inner City Schools According to SED Concentration
Grade 1

	SED_3	$NON\text{-}SED_3$	F ratio	df
Non-verbal (36)[a]	22.55	23.80	0.89	1,76
English lang. skills				
- listening (32)	16.11	16.61	0.08	1,82
- word analysis (49)	30.30	32.60	2.20	1,78
- reading (66)	26.12	35.04	8.00**	1,77
- spelling (27)	13.09	14.27	0.89	1,79
- usage (24)	11.27	12.98	2.91	1,79
Mathematics				
- concepts (33)	19.50	20.17	0.28	1,79
- problems (22)	10.61	12.04	2.49	1,77
- computation (26)	15.73	17.37	1.58	1,80
SCAMIN				
- motivation (60)	48.29	48.39	0.01	1,81
- self-concept (60)	45.21	46.22	0.62	1,81

[a] Maximum scores in parentheses

** $p < .01$

Table 12

Comparison of Grade Equivalent Scores on CTBS
According to SED Concentration
Grade 1

	80% - 100% SED		55% - 79% SED		Less than 55% SED	
	SED_1	$NON\text{-}SED_1$	SED_2	$NON\text{-}SED_2$	SED_3	$NON\text{-}SED_3$
English lang. skills						
- listening	13	18	12	14	14	14
- word analysis	14	20	15	17	16	19
- reading	16	24	14	17	13	17
- spelling	15	23	16	20	16	20
- usage	14	19	13	16	15	18
Mathematics						
- concepts	15	21	17	18	18	19
- problems	16	22	14	18	19	20
- computation	19	21	20	22	21	22

Table 13

Comparison of Stanine Scores on SCAMIN
According to SED Concentration
Grade 1

	80% - 100% SED		55% - 79% SED		Less than 55% SED	
	SED_1	$NON\text{-}SED_1$	SED_2	$NON\text{-}SED_2$	SED_3	$NON\text{-}SED_3$
Motivation						
- goal & achievement needs	4	5	4	5	5	4
- achievement investment	4	6	5	6	5	5
Self-concept						
- role expectations	5	5	5	5	5	5
- self-adequacy	5	4	5	5	4	5

Table 14A

Sample Sizes for Grade 4 According
to School Profile

Core Inner City Schools	SED_1	55
	$NON\text{-}SED_1$	21
Inner City Schools	SED_2	55
	$NON\text{-}SED_2$	33
Non-Inner City Schools	SED_3	33
	$NON\text{-}SED_3$	64

Table 14B

Sample Sizes for Grade 4 According
to SED Concentration

80% - 100% SED	SED_1	57
	$NON\text{-}SED_1$	8
55% - 79% SED	SED_2	40
	$NON\text{-}SED_2$	28
below 55% SED	SED_3	52
	$NON\text{-}SED_3$	82

Table 11

F Ratios for Two-way Analyses of Grade 6
Test Results According to School Profile

	School Profile	SSD/NON-SSD	Interaction
English lang. skills			
- vocabulary (36)[a]	2.11	5.75*	0.41
- reading (49)	1.05	19.85***	0.99
- spelling (36)	2.80	7.67**	0.24
- capitalization (29)	0.39	14.35***	0.80
- punctuation (29)	2.32	14.31***	0.34
- usage (29)	1.33	14.14***	0.21
Mathematics			
- concepts (32)	1.74	17.32***	0.37
- problems (25)	0.67	24.59***	0.63
- computation (42)	0.43	19.91***	0.14
French (28)	16.61***	0.01	3.31*
SCAMIN			
- motivation (120)	2.58	0.01	1.39
- self-concept (120)	8.46***	6.28*	3.69*

[a] Maximum scores in parentheses

*p < .05
**p < .01
***p < .001

Table 16

Comparison of Test Results of SED Groups
According to School Profile
Grade 4

	SED_1	SED_2	SED_3	F ratio[a]	df
Non-verbal (48)[b]	27.36	29.18	29.21	____	____
English lang. skills					
- vocabulary (36)	21.76	20.93	22.73	____	____
- reading (49)	22.74	21.65	20.15	____	____
- spelling (36)	23.32	21.64	21.44	____	____
- capitalization (29)	15.93	16.66	15.75	____	____
- punctuation (29)	12.89	14.45	11.38	____	____
- usage (29)	14.66	15.42	13.58	____	____
Mathematics					
- concepts (32)	16.35	16.87	15.79	____	____
- problems (25)	11.22	11.87	10.61	____	____
- computation (42)	27.63	20.97	26.36	____	____
French (28)	14.46	20.97	23.08	23.08***	2,93
SCAMIN					
- motivation (120)	101.59	98.06	98.31	____	____
- self-concept (120)	87.20	80.83	83.87	7.60***	2,133

[a] " ____ " indicates that the one way analysis of variance was not carried out following the absence of significant differences according to the factorial analysis

[b] Maximum scores in parentheses

***p < .001

Table 17

Comparison of Test Results of SED and NON-SED Groups
in Core Inner City Schools According to School Profile
Grade 4

	SED_1	$NON\text{-}SED_1$	F ratio[a]	df
Non-verbal (46)[b]	27.36	29.67	____	____
English lang. skills				
- vocabulary (36)	21.76	25.29	3.90	1,73
- reading (49)	22.74	26.86	4.93*	1,72
- spelling (36)	23.32	26.45	1.74	1,71
- capitalization (29)	15.93	18.35	2.67	1,71
- punctuation (29)	12.89	16.00	4.25*	1,71
- usage (29)	14.67	19.00	9.08*	1,71
Mathematics				
- concepts (32)	16.35	20.81	11.59**	1,73
- problems (25)	11.22	15.00	10.71**	1,73
- computation (42)	27.63	33.95	10.72**	1,73
French (28)	14.46	17.80	____	____
SCAMIN				
- motivation (120)	101.59	99.90	____	____
- self-concept (120)	87.16	91.05	2.92	1,69

a - "____" indicates that the one way analysis of variance was not carried out following the absence of significant differences according to the factorial analysis

b Maximum scores in parentheses

*$p < .05$
**$p < .01$

Table 10

Comparison of Test Results of SED and NON-SED Groups
in Inner City Schools According to School Profile
Grade 4

	SED_2	$NON\text{-}SED_2$	F ratio[a]	df
Non-verbal (48)[b]	29.18	30.42	____	____
English lang. skills				
- vocabulary (36)	20.93	22.27	0.65	1,85
- reading (49)	21.65	24.64	3.16	1,86
- spelling (36)	21.63	22.33	0.19	1,86
- capitalization (29)	16.65	19.30	4.32*	1,86
- punctuation (29)	14.45	15.91	1.72	1,86
- usage (29)	15.42	16.48	0.67	1,86
Mathematics				
- concepts	16.82	18.97	3.29	1,86
- problems (25)	11.87	14.21	4.91*	1,86
- computation (42)	29.04	30.78	1.32	1,85
French (28)	18.68	20.97	____	____
SCAMIN				
- motivation (120)	98.06	100.19	____	____
- self-concept (120)	80.83	87.06	9.14**	1,83

[a] " ____ " indicates that the one way analysis of variance was not carried out following the absence of significant differences according to the factorial analysis

[b] Maximum scores in parentheses

*p < .05
**p < .01

Table 13

Comparison of Test Results of SED and NON-SED Groups
in Non-Inner City Schools According to School Profile
Grade 6

	SED_3	$NON\text{-}SED_3$	F ratio[a]	df
Non-verbal (48)[b]	29.27	30.77	----	----
English lang. skills				
- vocabulary (36)	22.73	24.77	1.85	1,93
- reading (49)	20.15	26.30	15.05***	1,95
- spelling (36)	21.44	25.94	7.69**	1,93
- capitalization (29)	15.75	19.33	9.20**	1,93
- punctuation (29)	11.38	15.32	9.70**	1,93
- usage (29)	13.58	16.91	7.15**	1,93
Mathematics				
- concepts (32)	15.79	18.13	3.81	1,91
- problems (25)	10.61	14.03	10.07**	----
- computation (42)	26.36	31.92	9.72**	1,93
French (28)	23.08	21.77	----	----
SCAMIN				
- motivation (120)	96.21	97.63	----	----
- self-concept (120)	82.87	82.79	0.35	1,89

a - ---- indicates that the one way analysis of variance was not carried out following the absence of significant differences according to the factorial analysis

b Maximum scores in parentheses

**p < .01
***p < .001

Table 20

Comparison of Grade Equivalent Scores on CTBS
According to School Profile
Grade 4

	Core Inner City		Inner City		Non-Inner City	
	SED_1	$NON\text{-}SED_1$	SED_2	$NON\text{-}SED_2$	SED_3	$NON\text{-}SED_3$
English lang. skills						
- vocabulary	42	47	41	44	43	46
- reading	41	46	41	44	40	46
- spelling	46	50	43	44	43	47
- capitalization	41	44	43	48	41	47
- punctuation	43	47	47	49	39	47
- usage	40	46	42	43	36	44
Mathematics						
- concept	43	51	45	48	42	46
- problems	40	47	42	46	39	45
- computation	49	55	49	53	48	53

Table 21

Comparison of Stanine Scores on SCAMIN
According to School Profile
Grade 4

	Core Inner City		Inner City		Non-Inner City	
	SED_1	$NON\text{-}SED_1$	SED_2	$NON\text{-}SED_2$	SED_3	$NON\text{-}SED_3$
Motivation						
- goal & achievement needs	6	[illegible]	5	6	5	5
- achievement investment	6	[illegible]	6	6	6	6
Self-concept						
- role expectations	6	[illegible]	5	6	5	5
- self-adequacy	5	6	5	5	5	5

Table 23

Comparison of Test Results of SED Groups According to SED Concentration[a]
Grade 4

	SED_1	SED_2	SED_3	F ratio	df
Non-verbal (48)[b]	27.88	26.93	30.29	1.85	2,140
English lang. skills					
- vocabulary (36)	22.00	21.08	21.79	0.19	2,138
- reading (49)	22.50	21.62	21.02	0.54	2,138
- spelling (36)	22.76	22.41	21.57	0.35	2,137
- capitalization (29)	15.06	16.67	16.88	1.37	2,137
- punctuation (29)	13.76	12.97	12.71	0.49	2,137
- usage (29)	14.52	15.26	14.50	0.25	2,136
Mathematics					
- concepts	16.29	17.05	16.08	0.40	2,139
- problems (25)	11.78	11.21	10.98	0.45	2,139
- computation (42)	27.76	28.67	27.38	0.32	2,138
French (28)	17.08	16.71	22.59	11.25***	2,93
SCAMIN					
- motivation (120)	99.73	101.50	97.55	3.51*	2,133
- self-concept (120)	83.92	85.76	82.53	1.48	2,133

[a] Means joined by a line differ significantly from one another

[b] Maximum scores in parentheses

*$p < .05$
***$p < .001$

Table 23

Comparison of Test Results of SED and NON-SED Groups
in Core Inner City Schools According to SED Concentration
Grade 4

	SED$_1$	NON-SED$_1$	F ratio	df
Non-verbal (48)[a]	27.88	29.00	0.11	1,57
English lang. skills				
- vocabulary (36)	22.00	24.88	0.97	1,56
- reading (49)	22.50	28.16	3.83	1,56
- spelling (36)	22.76	25.75	1.04	1,56
- capitalization (29)	15.06	20.38	5.46*	1,56
- punctuation (29)	13.76	19.00	5.77*	1,56
- usage (29)	14.52	21.13	9.47**	1,56
Mathematics				
- concepts (32)	16.29	20.38	3.38	1,57
- problems (25)	11.78	15.63	4.67*	1,57
- computation (42)	27.76	33.88	3.88	1,56
French (28)	7.83	17.09	0.07	1,42
SCAMIN				
- motivation (120)	99.74	100.63	0.21	1,55
- self-concept (120)	83.92	92.63	6.64*	1,55

[a] Maximum scores in parentheses

*p <.05
**p <.01

Table 24

Comparison of Test Results of SED and NON-SED Groups
in Inner City Schools According to SED Concentration
Grade 4

	SED_2	$NON\text{-}SED_2$	F ratio	df
Non-verbal (48)[a]	26.92	29.04	0.76	1,66
English lang. skills				
- vocabulary (36)	21.08	22.57	0.84	1,66
- reading (49)	21.62	24.29	2.22	1,65
- spelling (36)	22.41	23.48	0.32	1,64
- capitalization (29)	16.67	18.00	0.89	1,64
- punctuation (29)	12.97	14.78	1.90	1,64
- usage (29)	15.26	16.44	0.70	1,64
Mathematics				
- concepts (32)	17.06	18.82	2.61	1,65
- problems (25)	11.21	13.18	2.74	1,65
- computation (42)	29.67	30.89	1.61	1,65
French (28)	16.71	18.13	0.53	1,34
SCAMIN				
- motivation (120)	101.80	100.63	0.26	1,64
- self-concept (120)	85.76	90.74	4.66*	1,64

[a] Maximum scores in parentheses

* $p < 0.05$

Table 25

Comparison of Test Results of SED and NON-SED Groups
in Non-Inner City Schools According to SED Concentration
Grade 4

	SED_3	$NON\text{-}SED_3$	F ratio	df
Non-verbal (48)[A]	30.29	31.11	0.40	1,132
English lang. skills				
- vocabulary (36)	21.79	24.64	4.77*	1,130
- reading (49)	21.02	26.28	15.82***	1,132
- spelling (36)	21.57	25.43	8.98**	1,130
- capitalization (29)	16.88	19.42	6.91**	1,130
- punctuation (29)	12.71	15.54	7.86**	1,130
- usage (29)	14.50	16.99	5.79**	1,130
Mathematics				
- concepts (32)	16.77	18.70	7.50**	1,132
- problems (25)	10.98	14.51	16.42***	1,132
- computation (42)	27.38	32.15	12.07***	1,130
French (28)	22.59	21.23	1.94	1,106
SCAMIN				
- motivation (120)	97.55	97.92	0.06	1,123
- self-concept (120)	82.53	82.90	0.05	1,123

[A] Maximum scores in parentheses

*p < .05
**p < .01
***p < .001

Table 26

Comparison of Grade Equivalent Scores on CTBS
According to SED Concentration
Grade 4

	80% - 100% SED		55% - 79% SED		Less than 55% SED	
	SED_1	$NON\text{-}SED_1$	SED_2	$NON\text{-}SED_2$	SED_3	$NON\text{-}SED_3$
English lang. skills						
- vocabulary	42	46	41	45	42	47
- reading	41	47	40	47	40	47
- spelling	45	51	44		43	51
- capitalization	39	50	42		42	49
- punctuation	45	56	43	45	42	49
- usage	40	53	[illegible]	42	39	45
Mathematics						
- concepts	43	50	44	47	42	48
- problems	42	49	40	44	40	47
- computation	50	56	46	52	50	55

Table 27

Comparison of Stanine Scores on SCAMIN
According to SED Concentration
Grade 4

	80% - 100% SED		55% - 79% SED		Less than 55% SED	
	SED_1	$NON\text{-}SED_1$	SED_2	$NON\text{-}SED_2$	SED_3	$NON\text{-}SED_3$
Motivation						
- goal & achievement needs	6	7	6	7	5	5
- achievement investment	6	6	7	6	6	6
Self-Concept						
- role exceptations	6	6	6	6	5	5
- self-adequacy	5	6	5	6	5	5

Appendix I

Explanation of Analysis of Covariance

Analysis of covariance is a statistical procedure which is similar to the analysis of variance in that it is used to compare the results of two or more groups on a particular test. At the same time, analysis of covariance mathematically reduces the influence that another variable, such as I.Q., might have on the test results. For example, if two hypothetical language groups under investigation differ a priori in terms of I.Q., and if it is believed that I.Q., will significantly influence performance on the test being administered (e.g., a reading test), then an analysis of covariance will estimate the significance of the language factor. This mathemetical procedure is used when it is difficult or impossible to select groups which are equivalent in I.Q.

Appendix II

Explanation of Grade Equivalents

The grade equivalent of a given raw score on any test indicates the grade level at which the typical pupil makes this raw score. In each score, the first digit represents the grade and the second digit the month within the grade in which the typical pupil makes the corresponding raw score. Strictly speaking, the second digit represents tenths of a year's difference between grade medians for successive years. For example, if a pupil makes a grade equivalent of 57, this means that the raw score on the test is the same as that made by the typical or median pupil in grade five at the end of the seventh month.

The grade equivalent of an entire group is a mean based on the individual grade equivalents of all the students in that group.

Appendix III

Interpretation of Stanine Scores

Stanine

The stanine scale is a single nine-point scale of standard scores. (The word stanine was derived from STAndard NINE-Point scale). In this scale, raw scores are converted to scores which range from 1 (low) to 9 (high) with a mean of 5 and a standard deviation of 2.

Figure [illegible] rentage of Cases at Each Stanine Level.

Meaning of Stanines
STAI Standard Score: NINE: Nine